Ohio Agricultural Experiment Station

CIRCULAR No. 106.

WOOSTER, OHIO, OCTOBER 1, 1910.

SEEDING LAWNS AND PERMANENT PASTURES.

The Station has successfully established several lawns by the following method: As soon as the ground is dry enough to work in the spring it is plowed and thoroughly pulverized by harrowing and cross-harrowing until in the condition of a garden. Unless the soil is very rich it should be made so, either by the liberal use of manure or of a complete fertilizer, the latter being preferable because of the seeds of weeds and coarse grasses usually carried in manure. For lawn purposes the fertilizer should carry 3 to 4 per-cent nitrogen, 8 to 10 or more percent phosphoric acid and 6 to 8 percent potash, and should be used at the rate of 600 to 800 pounds per acre, or 4 or 5 pounds to the square rod. An excellent lawn fertilizer may be made of steamed bonemeal and muriate of potash, used in the proportion of 200 pounds of the bonemeal to 40 pounds of the muriate. The two materials may be mixed together or spread separately, as is most convenient.

A mixture of equal weights of Kentucky Blue grass and Red Top, with a pound of white clover seed to a bushel of the mixture, is then sown broadcast, at the rate of two or more bushels per acre of the mixed seed, and harrowed in with a fine toothed harrow. If the ground should be very dry it may be rolled as part of the preparation for sowing, but the finishing touch should always be given with a smoothing harrow, or other fine-toothed harrow, as this leaves the surface in such condition as not to be so liable to be injuriously packed by rain as if finished with the roller.

The reason for mixing the Kentucky Blue Grass with Red Top is that the two grasses mature at different seasons, the Red Top reaching maturity some weeks later than the Blue Grass, thus keep-

ing up a better succession through the season, while the Blue Grass is better adapted to the dryer and the Red Top to the moister portions of the land. The clover is not only useful in thickening the sod, but by its ability to gather nitrogen it assists the growth of grasses with which it is sown.

For permanent pastures no better grasses have been found by the Station than the varieties above recommended for lawns. Sown together they give a succession throughout the season and adapt themselves to differences in soil, thus giving much better results than if either be sown alone. The seed of these grasses is relatively expensive, however, and it is more economical to reduce the quantity of seed of these varieties and substitute a moderate quantity of red and alsike clover and timothy seed. The first year after seeding the crop may be chiefly clover, and should be mown for hay. The second year it will be chiefly timothy, and after that the timothy will gradually disappear and the pasture grasses take its place. By this method of seeding not only will the first cost be reduced, but the clover will serve a most useful purpose in preparing the way for the grasses which are to follow. A mixture of 10 pounds Blue Grass, 8 pounds Red Top, 6 pounds Timothy, 4 pounds Red Clover and 2 pounds Alsike Clover per acre, will make a fair seeding. It will be well to divide it and sow one half crosswise of the other, harrowing the whole. In the case of pastures, as well as of lawns, the land should be manured or fertilized if not already rich, and here manure is the better material, if it can be obtained.

All old pastures or lawns should have an occasional dressing of manure or fertilizer. The object lessons in the scattered cattle droppings on the pastures demonstrate this point effectively. Such treatment will often thicken up the grass in an old lawn without reseeding, but if bare spots have made their apperance it will sometimes assist matters to apply a dressing of lime, at the rate of a bushel to the square rod, work it into the surface with a sharp rake or harrow, and after a few weeks re-seed as for a new lawn.

In those sections where the underlying rock is shale or sandstone it will often be found necessary to lime the land before Blue Grass can be grown successfully. For this purpose slaked or hydrated lime may be used at the rate of one ton per acre, or finely ground raw limestone in twice that quantity, the liming to be followed by fertilizing or manuring.

The Station's experiments have shown that it is often necessary to re-seed, as well as to use lime and manure or fertilizer, in order to bring an old pasture into profitable condition again.

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CIRCULAR No. 106

(*Revised Edition*)

WOOSTER, OHIO, JULY 1, 1921

CARE OF LAWNS AND PASTURES

Preparation of seedbed.—The first step in the making of a lawn, after the lawn has been properly graded, is to secure a good seedbed. Where the surface consists of subsoil brought up in excavating for the cellar and foundation walls it should be covered, if possible, with 2 or 3 inches of surface soil. This may sometimes be accomplished by moving a few inches of the surface to one side before beginning the excavation and returning it after the grading has been completed. Where this has not been done and it is impracticable to secure suitable soil it will be necessary to make the best of existing conditions.

It is difficult to make a good lawn on a very sandy soil, such as is frequently found along lake ridges, and in such a case it will be a material advantage to mix a few loads of clay with the upper 2 inches, in order to improve the water-holding capacity of the land. Such an admixture may be even better than the use of surface soil, if that is also quite sandy.

The heavy clays that constitute the subsoils over the larger part of the State may be improved by admixture of sand, or still better, of black earth, but as this is seldom practicable, their condition may be ameliorated by a liberal dressing of stable manure, if available. However, a great improvement may be made in the texture of the most refractory clays by growing a crop of either the common red clover or sweet clover on them. Of course, such treatment means a delay in the establishment of the lawn, but these clovers are biennials and will disappear after the second season if they are not permitted to reseed the land, while their dense masses of roots will separate the soil particles more perfectly than can be done even by manuring.

Liming the lawn.—Subsoils are usually better supplied with lime than the surface, but there are some deep sands in which lime

is deficient, while much of the surface soil east of the Scioto River must be limed before a satisfactory lawn or pasture can be made on it. The simplest method of determining whether lime is needed, and one which is sufficient for ordinary conditions, is the litmus test, which is made as follows:

Procure a little blue litmus paper, which should be found in any drug store, or will be sent free by the Experiment Station on request, and insert one end of a strip in a cut or gash an inch or so deep made in the soil with a clean knife-blade, at a time when the soil is wet. It is important that the knife-blade be perfectly clean, and also the fingers with which the paper is handled. Withdraw the knife and press the soil around the paper. After 5 or 10 minutes remove the paper and rinse the soil from it without tearing it. If the soil needs lime the color of the part of the paper that was in the soil will have turned to pink, while if no lime is needed the only change will be the darkening due to the paper being wet.

If the soil is dry a stiff paste may be made in a clean dish and the paper may be buried in this paste.

The water used should be tested with the paper to see that it does not change its color.

If the test indicates that lime is needed, common builder's lime may be used at the rate of 15 to 20 pounds per square rod, or finely-ground raw limestone may be used in double the quantity, sowing the lime broadcast over the surface and raking it in.

Fertilizing.—While it is only acid soils that will require liming, it may be taken for granted that it will pay to use acid phosphate or steamed bonemeal on any soil in Ohio. One or the other of these should be sown broadcast at the rate of 3 to 5 pounds to the square rod. Most soils will be benefited by a little potash, given in muriate of potash at the rate of 1 to 2 pounds per square rod, or unleached wood ashes at the rate of 20 to 40 pounds per square rod. Such ashes, used in the larger quantity, would make the use of lime unnecessary on most soils. A ready-mixed fertilizer, containing 10 to 12 percent phosphoric acid and 4 to 6 or more percent potash may be substituted for the acid phosphate or bonemeal and muriate of potash, using it at the rate of 5 to 8 pounds per square rod.

The fertilizing materials may be mixed or sown separately as is most convenient, but they should not be mixed with lime, except as they are mixed in the soil.

The grass seeds.—Three of the best lawns grasses are thoroughly established in Ohio. They are Kentucky Bluegrass (Poa pratensis), Redtop (Agrostis vulgaris) and the common white clover (Trifolium repens).

Kentucky Bluegrass (sometimes called June grass, from its date of maturing,) gets its name from the fact that it reaches its greatest perfection in the savannahs of the famous "Bluegrass" region of Kentucky, where a well-drained soil, underlaid with a phosphatic limestone, furnishes the optimum conditions for its growth. Here it grows close up to the trunks of the scattered oaks, and generally it is tolerant of moderate shade. With its fine, dark green foliage, its persistent habit and its adaptability to a considerable range of soil conditions, Kentucky Bluegrass is the most valuable of lawn grasses, but it must be well supplied with lime if it is to attain its greatest perfection.

The common Redtop (also known as Herds grass) is one of the so-called "Bent" grasses, some of which are more tolerant of lime deficiency in the soil than the variety under consideration, which is found in greatest luxuriance in natural meadows, where it occupies the zone of black land lying between the bur oaks and the sedge-covered swales. It is intolerant of shade, but will endure more moisture in the soil than Bluegrass. Its foliage closely resembles that of Bluegrass but it is somewhat lighter colored. It matures later than Bluegrass, and hence the two supplement each other advantageously. The black lands on which it grows most luxuriantly are well supplied with lime.

All the clovers are lime lovers and the wild white clover is no exception. Mixed with the grasses above named it increases the density and permanence of the sod. The relative proportion of clover and grass in the lawn may be controlled by the fertilizing. If nitrogen be omitted from the fertilizer clover will become conspicuous, whereas a dressing of nitrate of soda or sulphate of ammonia will cause the grasses to overshadow the clover.

Weeds.—If the lawn is so treated as to give the grasses the best conditions for their growth they will so occupy the land as to leave little room for weeds, and for those which may succeed in resisting the grasses there is probably no better remedy than to dig them out with a narrow hoe or knife.

Clipping.—The leaf is to the plant what lungs and stomach are to the animal, and hence it is essential to the permanence of the sod that it be not too closely shaven. On the other hand, the production of seed is the end for which many plants exist, and if this is permitted the vigor of the sod will be impaired. Clipping with such frequency as to prevent seed formation, and at such height as to leave sufficient leaf surface, which in practice means about 2 inches, will therefore serve the double purpose of making the lawn more attractive and of prolonging its life.

The time between clippings should be governed by the growth of the grass, which will be slower in dry than in wet weather. The only occasion for removal of the clippings is to avoid unsightliness, unless the work has been delayed too long and the growth has become so rank as to endanger smothering the grass by leaving the clippings on the ground. It is well to let the growth become larger in the late fall and to leave it uncut, as a protection through the winter.

The renewal of old lawns.—The appearance of weeds, mosses and bare spots in the lawn are suggestions that help is needed, and should be met by reducing the shade as much as possible, liming, fertilizing and reseeding.

Bare spots under large shrubbery may sometimes be hid by marginal plantings of smaller growths, but when this is not practicable the white or yellow woods violets would make an attractive ground cover that would not obtrude itself where not wanted.

THE GOLF COURSE

Golfers object to white clover because it does not endure trampling, and the omission of white clover means the omission of lime and the addition of nitrogen to the fertilizer. Probably the best varieties of grasses for the golf course are the Rhode Island Bent grass and Sheep's Fescue, both of which endure acid soil conditions.

A fertilizer that would accentuate the acid condition and would eventually drive out the white clover might be made up of 150 pounds of sulphate of ammonia, 250 pounds of acid phosphate and 50 to 100 pounds of sulphate of potash per acre.

THE CARE OF THE PASTURE

The qualities which make Kentucky Bluegrass so valuable as a lawn grass also give it the first place as a pasture grass, and for pastures, as for lawns, the most favorable soil conditions are efficient drainage, a soil of medium to close texture, with ample supplies of lime and phosphorus. Such soils are naturally formed by the decomposition of limestones, but where the foundation rock is sandstone or shale, or where it is covered with a heavy sheet of drift, improvement by liming or drainage, one or both, is necessary for profitable returns.